O.P.Code: 20CS0517	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
DATA WAREHOUSING AND DATA MINING
(Common to CAI, CIC & CCC)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12** = **60** Marks)

UNIT-I

1	a	Define Data mining? What are all points to be discussed to motivated at a mining?	CO1	L1	6M
	b	Explain Data mining as a step in the process of knowledge discovery.	CO1	L2	6M

OR

2	a	Classify different data pre-processing techniques used to improve the overall quality of the mined data.	CO1	L5	6M
	b	What is data cleaning? Describe in detail the different methods for data Cleaning.	CO1	L2	6M

UNIT-II

3	a	Discuss in detail about different types of Data Warehousing.	CO2	L6	6M
	b	Distinguish between OLTP and OLAP.	CO2	L4	6M

OR

4		Explain about the Three - tier data warehouse architecture with a neat diagram.	CO2	L2	12M

UNIT-III

5		Explain about the Apriori algorithm for finding frequent itemsets with an example	CO3	L5	12M

TID	*List of item_IDs*
T100	I1, I2, I5
T200	I2, I4
T300	I2, I3
T400	I1, I2, I4
T500	I1, I3
T600	I2, I3
T700	I1, I3
T800	I1, I2, I3, I5
T900	I1, I2, I3

Generate the list of frequent item-set ordered by their corresponding Suffixes, where the minimum support count is 2 and Minimum Confidence is 60%.

OR

6	a	Outline FP growth algorithm with an example.	CO4	L6	6M
	b	How will measure from Association Analysis to Correlation Analysis.	CO4	L2	6M

UNIT-IV

7		Explain the following terms i) Classification ii) Prediction	CO5	L2	12M

OR

8	a	Discuss about Rule based Classification method.	CO5	L6	6M
	b	Define Neural Network. Explain the Classification by Back Propagation.	CO5	L2	6M

UNIT-V

9	a	Define Clustering. List basic requirements of cluster analysis.	CO6	L2	6M
	b	Describe the working of PAM algorithm.	CO6	L2	6M

OR

10		Influence the importance of Grid-based and Model-Based methods in detail.	CO6	L2	12M

***** END *****

Q.P.Code: 20EE0223 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester Supplementary Examinations April-2026
POWER SYSTEM ANALYSIS
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

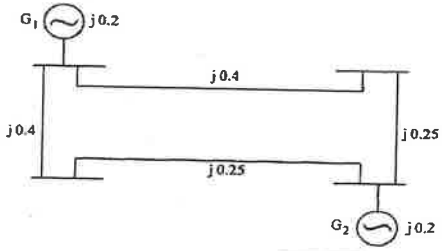
(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

1	a	What are the different power system elements in the power system network?	CO1	L2	6M
	b	Derive the necessary expressions for building up of Z-bus when New element is added to Reference.	CO1	L3	6M

OR

2		Form the Y_{BUS} by using singular transformation for the network shown below. Including the generator buses.	CO1	L3	12M

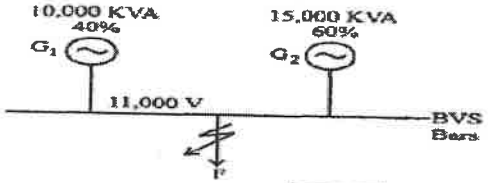


UNIT-II

3	a	Explain different types of reactors briefly.	CO2	L3	6M
	b	A three phase generator with constant terminal voltages gives the following currents when under fault: 1400 A for a line-to-line fault and 2200 A for a line-to-ground fault. If the positive sequence generated voltage to neutral is 2 ohms, find the reactance of the negative and zero sequence currents.	CO2	L3	6M

OR

4		What is the fault level? Consider the system shown in Fig below, The percentage of reactance each alternator is expressed on its own capacity determine the short circuit current that will flow into a dead 3 – Ø short circuit at F.	CO2	L4	12M



UNIT-III

5	a	What is load flow analysis? What is the necessity for load flow studies?	CO3	L2	6M
	b	What are the Known and Unknown parameters of each bus in Power system network and explain briefly	CO3	L3	6M

OR

6		Draw the flow chart for Gauss-Seidel method with PV buses and explain.	CO3	L3	12M

UNIT-IV

7		Draw a Flow Chart for N-R Rectangular Coordinate Method when PV Bus is absent.	CO4	L3	12M

OR

8	a	Explain about Decoupled Load Flow Method.	CO4	L3	6M
	b	Write the Comparison of Gauss-Seidel & Newton Rapson Method.	CO4	L2	6M

UNIT-V

9	a	What is stability? Explain different types of stabilities.	CO5	L2	6M
	b	Explain about power angle curve.	CO5	L3	6M

OR

10		Discuss the various methods of improving transient state stability.	CO5	L3	12M

*** END ***

O.P.Code: 20CS0523	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CIC, CSM, CSE, CSIT, CAD)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	What is iterative substitution method? Apply the Iterative substitution method to Solve the following Recurrence relations. $T(n) = 2T(n/2) + n$	CO1	L2	6M
	b	Define disjoint set. Explain any four types of disjoint sets operations with Examples.	CO1	L3	6M

OR

2		What is asymptotic notation? Explain different types of notations with examples.	CO1	L2	12M

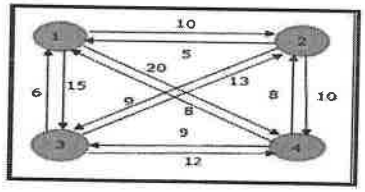
UNIT-II

3		Analyze the working strategy of merge sort and illustrate the process of merge sort algorithm for the given data: 43, 32, 22, 78, 63, 57, 91 and 13.	CO2	L3	12M

OR

4	a	Compare between BFS and DFS techniques.	CO2	L2	6M
	b	Analyze the Strassen's algorithm for matrix multiplication time complexity.	CO2	L3	6M

UNIT-III

5		Apply the minimum cost tour for given problem in travelling sales person Concepts by using dynamic programming. 	CO3	L3	12M

OR

6	a	Simplify the algorithm for Knapsack problem and analyze time complexity.	CO3	L2	6M
	b	Write short notes about about general method of greedy method with algorithm.	CO3	L2	6M

UNIT-IV

7		Find the LC branch and bound solution for the traveling sale person problem whose cost matrix is as follows: $\begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array}\begin{array}{c} \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \\ \begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix} \end{array}$	CO4	L3	12M

OR

8		Discuss the Hamiltonian cycle algorithm with step by step operation with example.	CO4	L3	12M

UNIT-V

9		How to make reduction for 3-sat to clique problem? and Explain	CO5	L2	12M

OR

10		Explain the following i) P class ii) NP class iii) NP complete iv) NP Hard v) Non-deterministic problem	CO5	L3	12M

***** END *****

O.P.Code: 20CS0533	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
CYBER SECURITY
(CSE (Artificial Intelligence and Data Science)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Define Cybercrime and information security.	CO1	L1	6M
	b	Discuss about who are Cybercriminals.	CO1	L2	6M
		OR			
2	a	Explain about Information Security Management related to Cyber Security.	CO1	L2	6M
	b	List out some Cyber Security Standards? Explain briefly.	CO1	L1	6M

UNIT-II

3	a	List out some basic Cyber Offences and summarize it.	CO2	L1	6M
	b	Differences between Active and Passive attacks in Cyber Security.	CO2	L2	6M
		OR			
4	a	Discuss about Social Engineering?	CO2	L2	6M
	b	Explain each type of Social Engineering in detail?	CO2	L2	6M

UNIT-III

5	a	Identify the LDAP Security in mobile computing devices	CO3	L2	6M
	b	Discuss the Security Challenges posed by Mobile Devices.	CO3	L2	6M
		OR			
6	a	Examine the credit card frauds in mobile & wireless devices	CO3	L3	6M
	b	Explain Security Implications for Organizations.	CO3	L2	6M

UNIT-IV

7	a	Explain in detail about Spywares and How it harms our machine.	CO4	L2	6M
	b	Distinguish Virus and Worms? How it harms our machine.	CO4	L2	6M
		OR			
8	a	Outline the purpose of proxy Server in detail.	CO4	L2	6M
	b	Who are Anonymizers and how they get affected by scams in Cybercrime? Explain.	CO4	L1	6M

UNIT-V

9	a	Describe about cost of Cybercrimes with examples.	CO5	L2	6M
	b	Explain the four key dimensions of privacy.	CO5	L2	6M
		OR			
10	a	Examine Web threats for organization in detail	CO5	L1	6M
	b	List the security and privacy implications in detail	CO5	L4	6M

***** END *****

O.P.Code: 20CS0534	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
HUMAN COMPUTER INTERACTION
(Common to CSIT, CSE, CSM & CIC)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	Explain in detail the concept of direct Manipulation.	CO1	L2	6M
	b	Examine the importance of good design.	CO1	L3	6M
		OR			
2	a	Compare and Contrast the advantages and disadvantages of Graphical Systems.	CO1	L4	6M
	b	What are the benefits of a well-designed interface.	CO1	L1	6M
		UNIT-II			
3	a	Discuss about interaction of people with computers.	CO2	L2	6M
	b	What are the human considerations in design? Explain	CO2	L1	6M
		OR			
4	a	Illustrate screen meaning and purpose.	CO2	L2	6M
	b	What are various types of statistical graphics? Explain it in detail.	CO2	L1	6M
		UNIT-III			
5	a	Explain in detail various Window characteristics.	CO3	L2	6M
	b	Discuss elaborately various components of a Window.	CO3	L2	6M
		OR			
6	a	Define the combination of Entry/Selection controls.	CO4	L1	6M
	b	Construct various structures of menus with diagrams.	CO4	L6	6M
		UNIT-IV			
7	a	What is an Icon? Explain different icons in detail.	CO5	L1	6M
	b	What is a color? List uses of color.	CO5	L1	6M
		OR			
8		Evaluation procedure for developing and conducting the test.	CO5	L4	12M
		UNIT-V			
9	a	Explain in brief, various specification methods for building an interface.	CO6	L2	6M
	b	What is the function of an input device? List various input devices.	CO6	L1	6M
		OR			
10	a	Write about the Borland J Builder interface building tool.	CO6	L1	6M
	b	Discuss about Microsoft Visual Studio.	CO6	L2	6M

*** END ***

O.P.Code: 20CS0535 | R20 | H.T.No. | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
MACHINE LEARNING
CSE (Artificial Intelligence)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	Differentiate Machine Learning and Artificial Intelligence.	CO5	L6	6M
	b	Describe classification techniques in supervised learning with an examples.	CO1	L2	6M
		OR			
2		Discuss clustering and association rules in unsupervised learning.	CO2	L2	12M
		UNIT-II			
3	a	Describe classification techniques in supervised learning.	CO1	L2	8M
	b	List out various Regression techniques in Machine Learning.	CO1	L1	4M
		OR			
4	a	Illustrate Multi- Layer Perceptron with neat architecture.	CO3	L3	6M
	b	Analyze Regression discrimination in machine learning.	CO1	L4	6M
		UNIT-III			
5	a	Explain the various Clustering algorithms.	CO2	L2	8M
	b	List out the various applications of clustering.	CO6	L1	4M
		OR			
6		Describe the various types of Hierarchal Clustering techniques.	CO3	L2	12M
		UNIT-IV			
7	a	Analyze the K-Nearest Neighbor Algorithm with simple example.	CO6	L4	6M
	b	Express the Non Parametric classification Techniques.	CO3	L6	6M
		OR			
8	a	Compare Multidimensionality scaling and Metric dimensionality scaling.	CO5	L5	6M
	b	List out the applications of MDS.	CO6	L1	6M
		UNIT-V			
9	a	Explain various types of reinforcement learning techniques.	CO4	L2	6M
	b	List out the advantages and disadvantages of Reinforcement Learning.	CO1	L1	6M
		OR			
10	a	Explain Generalization process in Model Based Learning.	CO5	L2	6M
	b	Difference between Model based learning and Model free learning.	CO4	L1	6M

***** END *****

O.P.Code: 20CS1001	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
CRYPTOGRAPHY & DATA SECURITY
(CSE With Specialisation in Cloud Computing)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Differentiate Substitution and Transposition techniques.	CO1	L3	6M
	b	Describe Symmetric and Asymmetric key cryptography techniques.	CO1	L2	6M
		OR			
2		Explain in detail about passive attacks and active attacks.	CO1	L2	12M

UNIT-II

3	a	Infer the Principles of Stream Cipher and Block cipher.	CO2	L2	6M
	b	Discuss key distribution in detail.	CO2	L2	6M
		OR			
4	a	Illustrate Conventional encryption model.	CO2	L3	6M
	b	State and explain the principles of public key cryptography.	CO2	L1	6M

UNIT-III

5	a	Explain the RSA algorithm. Compute cipher text for M=88, p=17, q=11, e=7.	CO3	L2	8M
	b	Write about the strength of RSA?	CO3	L1	4M
		OR			
6		Generalize the structure of DSA and its algorithms.	CO3	L2	12M

UNIT-IV

7		What is security attack? Explain different Types of Security attacks.	CO4	L2	12M
		OR			
8		Classify various types of viruses in IDS Security.	CO4	L4	12M

UNIT-V

9	a	Justify briefly about combining SecurityAssociations.	CO5	L5	8M
	b	Distinguish between Digital Signature and igital Certificate.	CO5	L4	4M
		OR			
10		Explain various types of Authentication Protocols and its advantages and disadvantages.	CO5	L2	12M

***** END *****

O.P.Code: 20CS1111	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
BIG DATA ANALYTICS
CSE (Artificial Intelligence and Data Science)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Examine the different types of digital data with examples.	CO1	L4	6M
	b	Summarize Big Data in terms of three dimensions, volume, variety and velocity.	CO1	L2	6M

OR

2	a	List out the challenges faced by big data.	CO1	L1	6M
	b	Examine the Significance of big data analytics.	CO2	L3	6M

UNIT-II

3		Illustrate the concepts of HDFS.	CO2	L3	12M

OR

4	a	Discuss about the data ingest operation using Sqoop and Flume.	CO2	L2	6M
	b	Differentiate the compression and serialization operation in Hadoop I/O.	CO2	L4	6M

UNIT-III

5	a	Discuss different types of failures in Classic MapReduce.	CO3	L1	6M
	b	List out the different types of failures in Yet Another Resource Negotiator.	CO3	L3	6M

OR

6	a	Summarize Task Execution Environment Properties.	CO4	L2	6M
	b	Discuss about Speculative Execution and its Properties.	CO4	L2	6M

UNIT-IV

7	a	Illustrate the concept of grunt.	CO5	L3	6M
	b	Why Do We Need Apache Pig? Identify the features of PIG.	CO5	L4	6M

OR

8	a	Discriminate the Structures, Statements in Pig Latin	CO5	L4	6M
	b	Evaluate Data Processing Operators in Pig Latin.	CO5	L5	6M

UNIT-V

9	a	Infer the advantages of Hive over traditional databases?	CO6	L2	6M
	b	What are the operators and functions in HIVE?	CO6	L1	6M

OR

10		Explain with a neat diagram the architecture of Hbase.	CO6	L2	12M

***** END *****

O.P.Code: 20EC0433	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
FIBRE OPTIC COMMUNICATIONS
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain the Elements of Optical Communication System with neat sketch.	CO1	L2	6M
	b	with neat sketch describe the characteristics of multimode Step index & graded index fibers.	CO1	L2	6M

OR

2	a	Define group velocity, Illustrate the impact of group delays in optical communication.	CO1	L2	6M
	b	What do you mean by pulse broadening? Explain its effect on information carrying capacity of a fiber.	CO1	L2	6M

UNIT-II

3	a	What are the various types of LED structures? Explain about double heterostructure with neat diagram.	CO2	L2	6M
	b	Illustrate the working principle of an edge emitter LED with neat diagram.	CO2	L2	6M

OR

4	a	Derive the expressions for LASER modes and threshold conditions.	CO2	L3	6M
	b	Describe about Temperature effects of Laser characteristics.	CO2	L1	6M

UNIT-III

5	a	Explain the principle behind the operation of an PIN Photo diode with its the energy band diagram.	CO3	L2	6M
	b	Explain in detail about the operation of Avalanche Photo Diode using suitable diagram.	CO3	L5	6M

OR

6	a	What is a preamplifier? Classify them.	CO3	L4	6M
	b	Construct the optical receiver configuration.	CO3	L2	6M

UNIT-IV

7	a	Analyze the system performance using link power budget of digital system.	CO4	L4	6M
	b	LED spectral width of 20 nm has rise time of 15 ns, tmat is 20ns, trx is 10ns and tmod is 2.5 ns. Find total system rise time.	CO4	L3	6M

OR

8	a	Describe about link budget calculations.	CO4	L2	6M
	b	Explain in detail about Optical amplifier with an example.	CO4	L2	6M

UNIT-V

9	a	What is optical Network? Explain the elements of optical network.	CO5	L2	6M
	b	Discuss about broadcast and select single hop network.	CO5	L6	6M

OR

10	a	Describe about the optical CDMA network using coded sequence pulse.	CO5	L2	6M
	b	Explain the Performance of WDM+EDFA systems in optical networks.	CO5	L2	6M

***** END *****

O.P.Code: 20EE0225	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
POWER SEMICONDUCTOR DRIVES
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Explain the operation of 1-Φ semi controlled converter fed by separately excited dc motor and draw its speed-torque characteristics.	CO1	L2	12M
		OR			
2		A 1-Φ, 230V, 50Hz supply feeds a separately excited dc motor through two 1-Φ semi converters, one for the field and the other for the armature. The firing angle for the semi converter in field circuit is zero, the field resistance is 200Ω and the armature resistance R_a is 0.3Ω. The load torque is 50 N-m at 900 rpm, the voltage constant is 0.8V/A-rad/s and the torque constant is 0.8N-m/A^2. Assume that the armature and field currents are continuous and constant, and neglect the losses. Find the following, a). The field current, b). The firing angle and c). The power factor of semiconverters in the armature circuit.	CO1	L3	12M

UNIT-II

3		Write a short notes on i). Plugging ii). Dynamic braking iii). Regenerative braking	CO2	L2	12M
		OR			
4	a	Compare ideal and practical dual converter based on various aspects.	CO2	L3	6M
	b	Compare practical non circulating and circulating type dual converter.	CO2	L3	6M

UNIT-III

5		Describe how the operation of second quadrant can be obtained from chopper fed by separately excited DC motor.	CO3	L2	12M
		OR			
6		Explain the closed loop speed control of dc motor and show how it can be achieved by using a chopper.	CO3	L3	12M

UNIT-IV

7	a	Explain voltage control method of induction motor drive.	CO4	L2	6M
	b	A 3-Φ star-connected 400V, 50Hz, 4-pole induction motor has the following per phase parameters referred to the stator: R_1=0.15Ω, X_1=0.45Ω, R_2'=0.12Ω, X_2'=28.5Ω. Compute the stator current and power factor when the motor is operated at rated voltage and frequency with S=0.04.	CO4	L3	6M
		OR			
8		Explain the Voltage source inverter control of induction motor.	CO4	L2	12M

UNIT-V

9		Explain load commutated voltage source inverter fed synchronous motor.	CO5	L2	12M
		OR			
10	a	Explain the operation of self - control synchronous motor.	CO5	L2	6M
	b	Discuss the operation of separate - control of synchronous motor.	CO5	L2	6M

*** END ***

29.04.26 (FN)

O.P.Code: 20HS0814 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
INTELLECTUAL PROPERTY RIGHTS
(Open Elective-II)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	What is Intellectual Property Rights (IPR)	CO1	L1	6M
	b	What are the different types of IPR, explain who is benefitted from each type of IPR and how?	CO1	L2	6M
		OR			
2	a	Explain with an example why Intellectual Properties need to be protected.	CO1	L2	6M
	b	Explain about International Organizations, Agencies and Treaties.	CO1	L2	6M
		UNIT-II			
3	a	What is Trademark? Differentiate between Trademark and design registration.	CO3	L2	6M
	b	Explain the different types of trademarks with examples.	CO3	L2	6M
		OR			
4	a	Explain about purpose and functions of Trademark.	CO3	L2	6M
	b	Explain Federal Registration of Trademarks.	CO4	L2	6M
		UNIT-III			
5	a	Describe Copyright and the works protected under the Copyright Act.	CO3	L2	6M
	b	Briefly explain the process of obtaining copyright.	CO4	L2	6M
		OR			
6	a	Explain the fundamental of Copyright Law.	CO3	L2	6M
	b	Describe the Rights afforded by the Copyright Law.	CO3	L2	6M
		UNIT-IV			
7		Why are trade secrets so significant and what is the negative aspect of trade secret?	CO4	L1	12M
		OR			
8	a	Describe why Trade Secrets are necessary. How do they function.	CO4	L2	6M
	b	Explain briefly about Trade Secret Law.	CO4	L2	6M
		UNIT-V			
9		Discuss whether the New Developments in the Right of Publicity is necessary, if so in what way.	CO6	L2	12M
		OR			
10		Explain new developments in the copyright protection for following: i) Computer programs ii)Video games iii)Piracy of software	CO6	L2	12M

***** END *****

O.P.Code: 20EC0452	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
ELEMENTS OF EMBEDDED SYSTEMS
(Open Elective-II)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	Sketch the various classifications of Embedded systems.	CO1	L3	6M
	b	Explain the classification of Embedded systems based on Performance and Functional Requirements.	CO1	L2	6M
		OR			
2		Briefly discuss the major application of Embedded systems	CO1	L2	12M
		UNIT-II			
3	a	Explain in detail the Core of the Embedded system.	CO2	L3	6M
	b	Distinguish between RISC and CISC design.	CO2	L2	6M
		OR			
4	a	Explain the working principle of Photo diode.	CO2	L3	6M
	b	Define sensor and Actuator and examples for each.	CO2	L2	6M
		UNIT-III			
5	a	Define on-board communication interface & List it.	CO3	L3	6M
	b	With a neat sketch explain UART communication interfaces.	CO3	L3	6M
		OR			
6	a	Explain the concept of Zigbee module.	CO3	L3	6M
	b	Explain the concept of RS485 communication Interface.	CO3	L4	6M
		UNIT-IV			
7	a	What is Arduino and list its advantages?	CO4	L3	6M
	b	What is interfacing with Arduino?	CO4	L3	6M
		OR			
8		Write a program for LCD and Keyboard programming interface for an Arduino.	CO4	L3	6M
			CO4	L2	6M
		UNIT-V			
9	a	What is IoT and its characteristics?	CO5	L3	6M
	b	What is an IP addresses and explain its working.	CO5	L3	6M
		OR			
10	a	What are the application layer protocols in IoT.	CO5	L3	6M
	b	Differentiate between MAC address and IP address.	CO5	L4	6M

***** END *****

O.P.Code: 20ME0355	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
GENERAL MECHANICAL ENGINEERING
(Open Elective-II)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Discuss about the Mechanical Properties of Engineering Materials.	CO1	L2	12M
		OR			
2	a	Explain the belt drive, including its merits and demerits.	CO1	L1	6M
	b	Distinguish between metals and non-metals.	CO1	L1	6M

UNIT-II

3	a	Explain the components of CIM with neat block diagram.	CO2	L3	6M
	b	List out various Benefits of CIM.	CO2	L1	6M
		OR			
4		Classify and Explain various types of Automation in the manufacturing Industry.	CO3	L3	12M

UNIT-III

5		Discuss about the following (i) Degrees of freedom (ii) Joints.	CO3	L2	12M
		OR			
6		Explain briefly about Advanced Machine Tools.	CO3	L2	12M

UNIT-IV

7		Classify Internal Combustion engines and write a detail note on that.	CO4	L4	12M
		OR			
8		Illustrate the importance of Vehicle chassis and also mention its Functions.	CO4	L3	12M

UNIT-V

9		Classify various types of refrigeration systems in detail.	CO5	L2	12M
		OR			
10	a	Explain the working of summer Air conditioning with a neat sketch	CO5	L2	6M
	b	With the neat circuit diagram describe the functioning of Winter Air conditioning system.	CO5	L2	6M

***** END *****

O.P.Code: 20CS0524	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
WEB TECHNOLOGIES
(Common to CSIT & CSE)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	What is Web Programming? Briefly explain the Architecture of WEB?	CO1	L1	6M
	b	What is HTML? Briefly explain the tags in HTML?	CO1	L1	6M
		OR			
2	a	What is CSS? Explain the CSS box model.	CO1	L6	6M
	b	What is Inheritance? Explain the CSS Inheritance?	CO1	L4	6M

UNIT-II

3		Define Function in JavaScript. Write a program using functions with arguments.	CO2	L2	12M
		OR			
4		List and explain JavaScript operators with an example.	CO2	L2	12M

UNIT-III

5	a	List out some of the HTML intrinsic event attributes.	CO2	L1	6M
	b	Define servlet. What are the functions of doGet() and doPost() methods?	CO2	L2	6M
		OR			
6		Explain about i) HTTP servlet Request ii) HTTP servlet Response with syntax.	CO2	L1	12M

UNIT-IV

7	a	What do you mean by i)PHP ii) Cookies	CO4	L1	6M
	b	What are XML Parsers? How is XML parsing done with SAX?	CO4	L1	6M
		OR			
8		Describe program control statements in PHP.	CO4	L4	12M

UNIT-V

9	a	What are i)Web Services ii) WSDL	CO5	L1	6M
	b	Define i) AJAX ii) SOAP?	CO5	L1	6M
		OR			
10		Explain client server architecture in AJAX	CO5	L3	12M

***** END *****

O.P.Code: 20CS0907	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
WEB PROGRAMMING FOR ARTIFICIAL INTELLIGENCE
CSE (Artificial Intelligence and Machine Learning)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Create a Simple job Registration form using HTML.	CO1	L6	12M
		OR			
2	a	List and explain in detail the various selector strings with example.	CO1	L2	6M
	b	What is XML? Briefly explain the namespaces in XML?	CO1	L2	6M

UNIT-II

3		Explain about LARAVEL framework.	CO2	L2	12M
		OR			
4		What are the MVC architectural patterns?	CO2	L1	12M

UNIT-III

5		Write a servlet code to get parameters from HTML document.	CO3	L2	12M
		OR			
6		Explain about i) HTTP servlet Request ii) HTTP servlet Response with syntax.	CO3	L2	12M

UNIT-IV

7		Design an application in node.js for student management.	CO4	L6	12M
		OR			
8		Explain Briefly Cookies and its types.	CO4	L2	12M

UNIT-V

9		Create a MongoDB collection of "Research articles "with required details.	CO5	L6	12M
		OR			
10		Create an application in node.js for student management.	CO5	L6	12M

***** END *****

O.P.Code: 20CS1205	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
VIRTUALIZATION TECHNIQUES
(Common to CAI & CCC)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Discuss the key components of system architectures relevant to virtualization.	CO1	L2	6M
	b	How different system architectures influence virtualization techniques.	CO1	L1	6M
		OR			
2		Explain the role of system architectures in virtualization and its impact.	CO1	L2	12M

UNIT-II

3	a	What is a resource pool in virtualization infrastructure	CO2	L1	6M
	b	Discuss the importance of a testing environment in the context of virtualization.	CO2	L3	6M
		OR			
4	a	Explain the concept of server virtualization and its benefits in modern IT environments.	CO2	L2	6M
	b	How are virtual workloads managed and optimized within a virtualized infrastructure?	CO2	L2	6M

UNIT-III

5	a	Explain WAN design principles for enterprise networks.	CO3	L2	6M
	b	How does WAN virtualization enhance scalability and flexibility?	CO3	L1	6M
		OR			
6		How are virtualization technologies integrated into traditional network architectures?	CO3	L3	12M

UNIT-IV

7		Discuss the concept of Label Switched Paths (LSPs) in network routing.	CO4	L2	12M
		OR			
8	a	How does control-plane virtualization enhance network management?	CO4	L3	6M
	b	Explain the role of routing protocols in network communication.	CO4	L2	6M

UNIT-V

9		What are the main differences between Guest OS, Host OS, Hypervisor, Emulation, and Kernel Level virtualization?	CO5	L3	12M
		OR			
10		Describe the functionalities offered by VirtualBox in enterprise virtualization setups.	CO5	L2	12M

***** END *****

O.P.Code: 20EC0422 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
EMBEDDED SYSTEMS AND IoT
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	Define embedded system and Write any four important characteristics of embedded systems.	CO1	L1	6M
	b	Distinguish between Von-Neumann and Harvard architecture.	CO1	L2	6M
		OR			
2	a	Explain Zigbee and GPRS.	CO1	L2	6M
	b	Explain the role of following circuitry in embedded system i) Reset Circuit ii) Brownout protection	CO1	L2	6M
		UNIT-II			
3	a	Classify the protocols associated with network/internet layer of IoT.	CO3	L4	6M
	b	Explain the various link layer protocols of IoT.	CO3	L2	6M
		OR			
4	a	With the help of following sectors explain how IoT technology is impacting on the agriculture sector: (i) Smart Irrigation (ii) Green house control	CO2	L2	6M
	b	Describe the implementation of IoT technology in Health and life style as health and fitness monitoring	CO2	L2	6M
		UNIT-III			
5	a	Define M2M and List out the communication protocols used for M2M local area networks.	CO3	L1	6M
	b	Explain the differences between Machines in M2M and Things in IoT.	CO3	L2	6M
		OR			
6		Explain in detail about Arduino board and I/O pins with a neat sketch.	CO3	L2	12M
		UNIT-IV			
7	a	Mention the advantages of IoT design methodology contrast to traditional designing of IoT.	CO2	L2	6M
	b	Describe the following steps involved in IoT system design methodology for " Information model Specification".	CO4	L2	6M
		OR			
8	a	Explain the following data types and data structures of python with an example. (i) Numbers (ii) Strings iii)Tuples	CO4	L2	6M
	b	Describe the packages used in python.	CO4	L2	6M
		UNIT-V			
9	a	With the help of neat diagram explain the basic building blocks of IoT device.	CO4	L2	6M
	b	Justify how Raspberry Pi is different from a desktop computer.	CO4	L6	6M
		OR			
10	a	Explain the use of SPI and I2C interfaces on raspberry pi.	CO5	L2	6M
	b	Illustrate how to interface a switch to raspberry pi.	CO6	L3	6M

*** END ***

O.P.Code: 20EC0416	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
MICROPROCESSORS AND MICROCONTROLLERS
(Electrical & Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	Describe microprocessor based system with bus architecture.	CO1	L1	6M
	b	Summarize the sequence of steps how the microprocessor works.	CO1	L2	6M
		OR			
2	a	Classify the memories and discuss each.	CO1	L3	6M
	b	Give the details of Latch and tri-state buffer with neat diagrams.	CO1	L1	6M
		UNIT-II			
3	a	Discuss the control signals in 8085.	CO2	L6	6M
	b	With neat diagram explain demultiplexing the bus AD7-AD0.	CO2	L1	6M
		OR			
4	a	Give the classification of instruction set and any 2 examples in each set	CO2	L1	6M
	b	Give the function of the following instructions A) LXI B) SBI C) POP D) JPO E) DI F) XCHG	CO2	L1	6M
		UNIT-III			
5	a	Review the PSW Register in 8051 microcontroller.	CO3	L1	6M
	b	Discuss how the Internal RAM memory is organized in 8051 microcontroller.	CO3	L6	6M
		OR			
6	a	Discuss the Auto Reload mode in the 8051 microcontroller.	CO3	L6	6M
	b	Explain the different serial data transmission modes in 8051.	CO3	L5	6M
		UNIT-IV			
7	a	Describe AJMP, LJMP, and ACALL.	CO4	L2	6M
	b	Give three different ways to clear the contents of the A register	CO4	L1	6M
		OR			
8	a	Discuss CJNE A add,radd , JZ and DJNZ R,radd.	CO4	L6	6M
	b	Draw and explain the external addressing using MOVX and MOVC.	CO4	L1	6M
		UNIT-V			
9	a	Discuss about Keyboards and human factors.	CO5	L6	6M
	b	Illustrate the the programs for keyboards.	CO5	L2	6M
		OR			
10	a	Illustrate the multiple source interrupt circuit used in Lopri and Hipri Program.	CO5	L2	6M
	b	Explain multiple interrupts present.	CO5	L2	6M

***** END *****

O.P.Code: 20CS0906	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
ADVANCED MACHINE LEARNING
CSE (Artificial Intelligence and Machine Learning)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain the working process of Machine Leaning and its Applications.	CO1	L2	6M
	b	Analyze Well Posed Problems in machine learning with examples.	CO1	L4	6M
		OR			
2	a	Compare Supervised learning and Unsupervised learning	CO1	L6	6M
	b	Analyze Reinforcement Learning with neat diagram.	CO1	L4	6M
		UNIT-II			
3	a	List out the various regression techniques in supervised learning.	CO1	L2	6M
	b	Explain Linear models for Regression in Machine Learning.	CO1	L2	6M
		OR			
4	a	List out various common regression algorithms explain it	CO4	L3	6M
	b	Analyze Bayesian Linear Regression with simple example.	CO2	L2	6M
		UNIT-III			
5		Describe the various types of Hierarchal Clustering techniques.	CO4	L2	12M
		OR			
6	a	Explain the various Clustering algorithms.	CO3	L2	6M
	b	List out the various applications of clustering	CO3	L1	6M
		UNIT-IV			
7	a	Explain about Dimensionality reduction and its techniques	CO5	L2	6M
	b	List out the categories of features subset selection and explain it.	CO5	L2	6M
		OR			
8	a	Illustrate Condensed Nearest Neighbor (CNN)	CO5	L3	6M
	b	Differentiate Exploratory and Confirmatory factor analysis.	CO5	L5	6M
		UNIT-V			
9	a	Define and explain about the Reinforcement learning	CO6	L2	6M
	b	Compare unsupervised learning and Reinforcement learning.	CO6	L4	6M
		OR			
10	a	List the applications and various elements of RL explain it.	CO6	L2	6M
	b	Differentiate the Reinforcement learning and Supervised learning	CO6	L4	6M

***** END *****

O.P.Code: 20CI0608	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
DATA ANALYTICS USING R
(Computer Science & Information Technology)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain the needs of Data Analytics.	CO1	L3	6M
	b	Find the mean, median and mode of the following data: 23, 57, 24, 49, 31, 37, 10, 30, 57, 40, 35, 16, 57, 29, 03, 40.	CO1	L2	6M
		OR			
2	a	Explain the Normal Distribution in detail.	CO1	L2	6M
	b	Suppose the current annual salary of all teachers in the United States have a normal distribution with a mean of 51000 dollars and a standard deviation of 6000 dollars. Find the probability that the annual salary of a randomly selected teacher would be between 42000 and 65000.	CO1	L3	6M

UNIT-II

3	a	Discuss in detail about the Linear regression.	CO2	L2	6M
	b	Explain and compare command line and scripts in R.	CO2	L3	6M
		OR			
4	a	Explain the Chi-Square test in detail.	CO2	L2	6M
	b	Explain following Data structures: (i) Vectors (ii) Character Strings	CO2	L3	6M

UNIT-III

5	a	Illustrate the output statements with example.	CO3	L3	6M
	b	Write a R program to find factorial of a given number.	CO3	L2	6M
		OR			
6		Examine the syntax of the following statements with an example program. i) for loop ii) while loop iii) repeat loop	CO3	L3	12M

UNIT-IV

7	a	How to access the elements of a vector?	CO4	L3	6M
	b	Explain how to access the elements of an matrix with an example.	CO4	L2	6M
		OR			
8	a	Create a vector with some of your friend's names i. Get the length of above vector. ii. Get the first two friends from above vector. iii. Get the 2nd and 3rd friends. iv. Sort your friends by names using 2 methods.	CO4	L3	6M
	b	Explain how to access the elements of an array.	CO4	L2	6M

UNIT-V

9	a	Explain list indexing with an example.	CO5	L2	6M
	b	Define Data Visualization and Explain some data visualization techniques in brief.	CO5	L3	6M
		OR			
10		Explain the following techniques with syntax and example. i. Bar chart ii. Box plots	CO5	L3	12M

***** END *****

O.P.Code: 20CS0522	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
ARTIFICIAL INTELLIGENCE
(Computer Science & Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	Discuss in detail an importance of AI.	CO1	L3	6M
	b	Explain in Detail various Types of Knowledge.	CO1	L4	6M
		OR			
2	a	Difference between Forward Chaining and Backward Chaining.	CO1	L3	6M
	b	Explain various AI Methods to Perform Decision Making under Uncertainty.	CO1	L2	6M
		UNIT-II			
3	a	Evaluate a problem as a state space search with an example.	CO2	L4	6M
	b	Illustrate the concept of Problem Solving Agent with an example.	CO2	L3	6M
		OR			
4		Discuss the Eight Queen's problem. Draw the portion of the state space tree for Eight Queens using Backtracking Algorithm	CO2	L4	12M
		UNIT-III			
5	a	List and explain Various levels of knowledge-based agent	CO3	L4	6M
	b	Define Propositional logic and explain Syntax of proposition Logic with logical equivalence	CO3	L2	6M
		OR			
6	a	Explain the inference process in First order logic, using suitable example	CO3	L3	6M
	b	Explain resolution in predicate logic with suitable example	CO3	L4	6M
		UNIT-IV			
7		Explain the various forms of Learning Types.	CO4	L3	12M
		OR			
8	a	Analyze the Linear Regression in Supervised Learning.	CO4	L3	6M
	b	Discriminate Logistic Regression analysis in Supervised Learning.	CO4	L3	6M
		UNIT-V			
9	a	Discuss about Characteristics and Capabilities of Expert Systems.	CO5	L2	6M
	b	Explain Expert Systems Limitations in detail.	CO5	L3	6M
		OR			
10	a	List out the Benefits of Expert Systems.	CO5	L2	6M
	b	Discuss about hybrid expert system in detail.	CO5	L3	6M

***** END *****

O.P.Code: 20EC0421	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
ANTENNAS AND WAVE PROPAGATION
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Write short notes on effective aperture.	CO1	L1	6M
	b	Define the following terms. i) Radiation Resistance ii) Bandwidth iii) Beam Efficiency	CO1	L1	6M
		OR			
2		Derive the expression for radiation Parameters of a Quarter wave monopole antenna.	CO3	L3	12M
		UNIT-II			
3	a	Discuss the folded dipole antenna and its input impedance.	CO4	L2	6M
	b	What are parasitic elements & where they are used?	CO4	L1	6M
		OR			
4		Write a short notes on the following: i) Helical Antenna ii) Horn antenna	CO2	L1	12M
		UNIT-III			
5		Discuss the characteristics of Microstrip Antenna.	CO2	L1	12M
		OR			
6	a	Explain Gain measurement by direct comparison method.	CO5	L5	6M
	b	Explain the gain measurement using absolute method.	CO5	L5	6M
		UNIT-IV			
7		Derive the expression for far field pattern of an array of two isotropic point sources at equal amplitude & same phase.	CO4	L4	12M
		OR			
8	a	What is Broad side array and its radiation pattern.	CO4	L2	4M
	b	Deduce the characteristics of n-elements End fire array.	CO4	L3	8M
		UNIT-V			
9		Explain Reflection and Refraction of sky waves by ionosphere.	CO6	L2	12M
		OR			
10	a	Explain Maximum usable frequency with its expression.	CO6	L2	6M
	b	Determine the maximum usable frequency for a critical frequency of 20 MHz and an angle of incidence of 350.	CO6	L2	6M

***** END *****

24/4/26 RN

O.P.Code: 20EE0224	R20	H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
POWER SYSTEM OPERATION AND CONTROL
(Electrical & Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	What is the need of system variables and explain briefly.	CO1	L2	6M
	b	Explain about optimum generation allocation with line loss neglected	CO1	L2	6M
		OR			
2		Derive the expression for general transmission loss formula in Optimal operation of Thermal Power Station.	CO1	L3	12M
		UNIT-II			
3	a	What is the necessity of connecting two different plants on same load?	CO2	L1	4M
	b	Explain the hydro-thermal co-ordination and its importance.	CO2	L2	8M
		OR			
4		In a two-plant operation system, the hydro-plant operates for 8 hr during each day and the steam plant operates throughout the day. The characteristics of the steam and hydro-plants are CT = 0.025 P2GT + 14 PGT + 12 Rs./hr WH = 0.002 P2GH + 28 PGH m3 /s. When both plants are running, the power flow from the steam plant to the load is 190 MW and the total quantity of water used for the hydro-plant operation during 8 hr is 220 × 106 m3. Determine the generation of a hydro-plant and cost of water used. Neglect the transmission losses.	CO2	L3	12M
		UNIT-III			
5	a	Draw the block diagram of steam turbine and explain it in detail	CO3	L1	6M
	b	Discuss about transfer functions of reheat and non – reheat turbine	CO3	L2	6M
		OR			
6		Derive the mathematical modeling of speed governing system	CO3	L3	12M
		UNIT-IV			
7		Draw the block diagram representation of a single area system and deduce the expression for the steady state response of the system.	CO4	L1	12M
		OR			
8		Give typical block diagram for a two-area system inter connected by tie line and explain each block	CO4	L2	12M
		UNIT-V			
9		What are the different types of compensating equipment used for transmission systems. Explain all in detail.	CO5	L3	12M
		OR			
10	a	Explain the limitations of series compensation.	CO5	L2	6M
	b	What is surge impedance loading and also derive the necessary equations.	CO5	L1	6M

***** END *****

O.P.Code: 20CS1104	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
R PROGRAMMING FOR DATA SCIENCE
CSE (Artificial Intelligence and Data Science)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1		What is R? Briefly describe the history and development of the R programming language.	**CO1**	**L2**	**12M**
		OR			
2	**a**	Illustrate how to declare and assign values to variables in R with a program?	**CO1**	**L3**	**6M**
	b	Determine Vector and its functions with examples.	**CO1**	**L3**	**6M**
		UNIT-II			
3	**a**	Discuss the factors to consider when deciding whether to use an explicit return () statement.	**CO2**	**L2**	**6M**
	b	Develop a R program to check for leap year or not.	**CO2**	**L6**	**6M**
		OR			
4	**a**	Develop a function that takes two arguments with default values and returns their sum.	**CO2**	**L6**	**6M**
	b	Describe how to iterate over a list or a data frame using a loop.	**CO2**	**L2**	**6M**
		UNIT-III			
5	**a**	Explain following functions with example i)dnorm ii)qchisq iii)qbinom iv)rnorm	**CO3**	**L2**	**6M**
	b	Explain reading and writing files in R.	**CO3**	**L2**	**6M**
		OR			
6		Demonstrate the vector cross product and its applications in R.	**CO3**	**L4**	**12M**
		UNIT-IV			
7	**a**	How do you add labels to the axes of a graph created with the plot() function?	**CO4**	**L2**	**6M**
	b	Discover the purpose of the file parameter in the plot() function for saving graphs.	**CO4**	**L3**	**6M**
		OR			
8	**a**	Illustrate Data visualization with R and ggplot2.	**CO4**	**L3**	**6M**
	b	Illustrate the concept of data visualization and its importance in data analysis.	**CO4**	**L3**	**6M**
		UNIT-V			
9	**a**	Analyze the purpose of T-tests in statistical analysis and provide examples of when they are used.	**CO5**	**L4**	**6M**
	b	Describe the process of multiple regression and its applications.	**CO5**	**L2**	**6M**
		OR			
10	**a**	Give examples of real-world scenarios where random forests are used for predictive modeling.	**CO5**	**L3**	**6M**
	b	Categorize the principles behind decision trees and their application in random forests.	**CO5**	**L4**	**6M**

***** END *****

Q.P.Code: **20EC0423**	R20	**H.T.No.**									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
MICROWAVE THOERY AND TECHNIQUES
(Electyronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Discuss the history in the evolution of Microwaves?	CO1	L1	6M
	b	Describe the concept of dominant mode with suitable examples.	CO1	L2	6M
		OR			
2	a	Define the following terms: i) Guide wavelength ii) Phase Velocity iii) Group Velocity.	CO1	L1	6M
	b	The dimensions of a guide are 2.5x1cms.The frequency is 8.6 GHz. Find the cutoff frequencies for TE10 and TE01 mode.	CO1	L3	6M

UNIT-II

3	a	Sketch and explain the working of coaxial line transmission line.	CO2	L1	6M
	b	Derive the equation for the propagation of TE waves in rectangular waveguide.	CO2	L2	6M
		OR			
4	a	Describe the circular waveguide and the equation of cut off frequency and its dominant mode.	CO2	L1	6M
	b	Describe the cavity resonator with neat sketch and List it types & applications.	CO2	L2	6M

UNIT-III

5	a	Interpret the mechanism of coupling in a waveguide.	CO3	L2	6M
	b	Explain the significance and formulation of S-matrix in detail.	CO3	L2	6M
		OR			
6	a	A directional coupler has the scattering matrix given below. Evaluate its directivity, coupling, and isolation.	CO3	L2	6M

$$[S]=\begin{bmatrix} 0.05\angle 30 & 0.96\angle 0 & 0.1\angle 90 & 0.05\angle 90 \\ 0.96\angle 0 & 0.05\angle 30 & 0.05\angle 90 & 0.1\angle 90 \\ 0.1\angle 90 & 0.05\angle 90 & 0.04\angle 30 & 0.96\angle 0 \\ 0.05\angle 90 & 0.1\angle 90 & 0.96\angle 0 & 0.05\angle 30 \end{bmatrix}$$

	b	Derive S-matrix for Directional Coupler.	CO3	L2	6M

UNIT-IV

7	a	Compare between the type Microwave tubes and M type Microwave tubes.	CO4	L3	6M
	b	Explain the constructional details and principle of operation of two cavity klystron with the neat sketch.	CO4	L2	6M
		OR			
8	a	Explain the velocity modulation process in two cavity Klystron tube.	CO4	L2	6M
	b	What is meant by bunching process and transit time?	CO4	L1	6M

UNIT-V

9	a	Sketch and briefly explain the functions of different blocks of a microwave bench.	CO5	L2	6M
	b	Discuss in detail about the microwave power measurement using Bolometric technique.	CO5	L2	6M
		OR			
10	a	Define VSWR.How to calculate reflection coefficient from VSWR measurements.	CO5	L2	6M
	b	List the possible errors in VSWR measurement.	CO5	L2	6M

***** END *****

O.P.Code: 20CS1005	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026

CYBER CRIME INVESTIGATION & DIGITAL FORENSICS
CSE (Internet of Things and Cyber security Including Block Chain Technology)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	What is Cybercrime? Explain different classifications of Cybercrime?	CO1	L2	6M
	b	Illustrate the challenges and prevention of Cybercrime?	CO1	L2	6M
		OR			
2	a	Classify the different social engineering attack techniques?	CO1	L2	6M
	b	Compare Individual and Government/Organization Cybercrime?	CO1	L4	6M
		UNIT-II			
3		Explain the process of Computer Intrusion in detail?	CO4	L5	12M
		OR			
4	a	Explain Trojans, Viruses, Worms and Backdoor attacks?	CO4	L2	6M
	b	Give brief description about types of Exploitation?	CO4	L2	6M
		UNIT-III			
5		Explain in detail about digital evidence collection?	CO3	L5	12M
		OR			
6		Explain the recovery process of deleted evidences?	CO3	L5	12M
		UNIT-IV			
7		Discuss in detail about Digital Forensics?	CO4	L6	12M
		OR			
8		Distinguish Face and IRIS Recognition?	CO4	L4	12M
		UNIT-V			
9		Explain CERT in detail?	CO5	L2	12M
		OR			
10		Explain security quality management services?	CO5	L2	12M

***** END *****

O.P.Code: 20CS1406	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
AI IN WEB TECHNOLOGIES
CSE (Artificial Intelligence)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1		Create a Simple job Registration form using HTML	CO1	L6	12M
		OR			
2	a	What is client side and server side programming?	CO1	L1	6M
	b	Discuss the Levels of DOM	CO1	L2	6M
		UNIT-II			
3		Explain briefly about MVC.	CO2	L2	12M
		OR			
4	a	What are the MVC architectural patterns?	CO2	L1	6M
	b	Discuss about AngularJS Objects?	CO2	L2	6M
		UNIT-III			
5	a	What is servlet?What are the advantages of servlet?	CO3	L1	6M
	b	What is Servlet Context Interface?	CO3	L1	6M
		OR			
6	a	Explain in detail about Get method.	CO3	L2	6M
	b	Illustrate AJAX framework and its security.	CO3	L2	6M
		UNIT-IV			
7		Explain node.js with example.	CO4	L2	12M
		OR			
8	a	Distinguish between different types of web server architectures.	CO4	L4	6M
	b	Discuss Rendering JSON Data.	CO4	L2	6M
		UNIT-V			
9	a	Discuss the features of MongoDB.	CO5	L2	6M
	b	List out Various Frontend Web frameworks and explain in detail.	CO5	L1	6M
		OR			
10	a	What is MeteorJS framework and explain in detail with an example?	CO5	L2	6M
	b	Describe Meteor framework in detail.	CO5	L2	6M

***** END *****

O.P.Code: 20CS1103 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations April-2026
FUNDAMENTALS OF MACHINE LEARNING
(Common to CCC & CAD)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1	a	What is Machine learning? Explain the need of it.	CO1	L1	6M
	b	List out applications and algorithms used in Machine Learning. Explain it?	CO1	L1	6M
		OR			
2	a	Differentiate Machine Learning and Artificial Intelligence.	CO1	L2	6M
	b	Describe classification techniques in supervised learning with an examples.	CO1	L2	6M
		UNIT-II			
3	a	Compare Supervised learning and Unsupervised learning	CO2	L2	6M
	b	Analyze Reinforcement Learning with neat diagram.	CO2	L4	6M
		OR			
4	a	Differentiate Machine Learning and Artificial Intelligence.	CO2	L2	6M
	b	Describe classification techniques in supervised learning with an examples.	CO2	L2	6M
		UNIT-III			
5	a	Demonstrate linkage methods in Hierarchical Clustering .	CO3	L2	6M
	b	How can we measure the distance between two clusters?	CO3	L1	6M
		OR			
6	a	List out the various types of Cluster methods in unsupervised learning.	CO3	L1	6M
	b	Infer the similarities and differences between average-link clustering and k-means?	CO3	L2	6M
		UNIT-IV			
7	a	Define and Explain about Non parametric Methods.	CO4	L1	6M
	b	List out Advantages and limitations of Non parametric methods in ML.	CO4	L1	6M
		OR			
8	a	Compare Multidimensionality scaling and Metric dimensionality scaling.	CO4	L2	6M
	b	List out the applications of MDS.	CO4	L1	6M
		UNIT-V			
9	a	Explain in detail about Single State Case: K-Armed Bandit problem	CO5	L2	6M
	b	What are the Elements involved in Reinforcement Learning using Markov Decision Process (MDP)?	CO5	L1	6M
		OR			
10	a	Illustrate in detail about K-Armed Bandit in reinforcement learning.	CO5	L2	6M
	b	Describe Exploration and Exploitation strategies in temporal difference learning.	CO5	L2	6M

***** END *****

O.P.Code: 20ME0320	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year II Semester Supplementary Examinations April-2026

DesignofMachineElements-II

(Mechnaical Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain what you understand by A.M. Wahl's factor and state its importance in the design of helical springs	CO1	L2	4M
	b	A mechanism used in printing machinery consists of a tension spring assembled with a preload of 30 N. The wire diameter of spring is 2 mm with a spring index of 6.The spring has 18 active coils.The spring wire is hard drawn and oil tempered having following material properties: Design shear stress = 680 MPa, Modulus of rigidity = 80 kN/mm2. Determine: (i) The initial torsionalshearstressinthewire.(ii)Spring rate.(iii)The force to cause the body of the springtoitsyieldstrength	CO1	L5	8M

OR

2		Design a helical compression spring for a maximum load of 1000 N for a deflection of 25 mm using the value of spring index as 5. The maximum permissible shear stress for spring wire is 420 MPa and modulus of rigidityis84kN/mm2.	CO1	L6	12M

UNIT-II

3		A75mm journal bearing100mm long is subjected to 2.5kN at 600rpm. If the room temperature is 240C, what viscosity of oil should be used to limit the bearing surface temperature at 550C,D/C=1000.	CO2	L5	12M

OR

4		The ball bearing for the drilling machine spindle is rotating at 3000rpm.It is subjected to radial load of 2500N andanaxialload of 1500N.It is to work 50ho ursperweek fo r one year.Design a suitable bearing if the diameter of thes pindleis 40mm.	CO2	L6	12M

UNIT-III

5	a	Listthematerialsusedforbelts?Howarewireropesdesignated?	CO3	L1	6M
	b	)MentionthematerialsusedforSheeveanditscharacteristics.	CO3	L1	6M

OR

6		Two shafts whose centres are 1 metre apart are connected by a V-belt drive. The driving pulley is supplied with 95 Kw power and has an effective diameter of 300 mm. It runs at 1000 r.p.m. while the driven pulley runs at 375 r.p.m. The angle of groove on the pulleys is 40°. Permissible tension in 400 mm2 cross-sectional area belt is 2.1 Mpa. The material of the belt has density of 1100 kg / m3. The driven pulley is overhung, the distance of the centre from the nearest bearing being 200 mm. The coefficient of friction between belt and pulley rim is 0.28. Estimate:1.Thenumberofbeltsrequired.Diameterofdrivenpulleyshaft,ifper missibleshearstressis42Mpa.	CO5	L6	12M

UNIT-IV

7		A pair of straight spur gears is required to reduce the speed of shaft from 500 to 100 rpm while continuously running 12hrper day. The pinion is of 40C8steel and has 20teeth. The wheel isofcast iron ofgrade FG200 and has 100 teeth. The gears are of 8mm module, 100 mm face width and 200 pressureangle.Calculatepowerrating.	CO5	L5	12M

OR

8	A Pair of parallel helical gears consists of 23 teeth pinion meshing with a 46 gear teeth. The helix angle is 24o and the normal pressure angle is 21o. Calculate: (i) transverse module (ii) transverse pressure angle (iii) The Axial pitch (iv) the pitch circle diameters of the pinion and the gear (v) the centre distance (vi) the addendum and the dedendum circle diameters ofthepinion.	**CO5**	**L5**	**12M**

UNIT-V

9	APairofwormgearisdesignatedas2/54/10/5. Calculate(i)Centredistance (ii)Speedreduction (iii)Thedimensionsoftheworm (iv)thedimensionsofthewormwheel.	**CO6**	**L5**	**12M**

OR

10	Design a plain carbon steel centre crank shaft for a single acting four stroke single cylinder engine for the following data: Bore = 400 mm; Stroke = 600 mm; Engine speed = 200 r.p.m; Mean effective pressure = 0.5N/mm2;Maximumcombustionpressure=2.5N/mm2; Weight of fly wheel used as a pulley = 50 kN; Total belt pull = 6.5 kN. When the crank has turned through 35 degrees from the top dead centre, the pressure on the piston is 1 N/mm2 and torque on the crank is maximum. The ratio of the connecting rod length to the crank radius is 5. Assume anyotherdatarequiredforthedesign.	**CO6**	**L6**	**12M**

***** END *****